

What is claimed is:

1 1. A black hexavalent chromium-free plating treatment
2 system which is designed so that the corrosion resistance of
3 a surface of a metal part is improved by

4 plating the surface of the metal part as a base with zinc
5 in a zinc plating treatment step (10),

6 activating a surface of the zinc-plated coating in a
7 treatment solution in a dilute nitric acid activation treatment
8 step (11),

9 then rinsing the activated metal part to remove nitric
10 acid components,

11 subsequently forming a black coating on the rinsed metal
12 part in an inorganic salt solution containing trivalent chromium
13 and iron components as main ingredients in a black chromate
14 treatment step (20),

15 rerinsing the black coated metal part,

16 then subjecting the rerinsed metal part to a finish
17 treatment by forming a conversion coating on the rerinsed metal
18 part in a solution of inorganic salt and organic acid containing
19 trivalent chromium and silica as main ingredients in a finish
20 treatment step (30), and

21 drying the finished metal part in a drying step (34).

1 2. A black hexavalent chromium-free plating treatment
2 system which is designed so that the corrosion resistance of

3 a surface of a metal part is improved by
4 plating the surface of the metal part as a base with zinc
5 in a zinc plating treatment step,
6 activating a surface of the zinc-plated coating in a
7 treatment solution in a dilute nitric acid activation treatment
8 step,
9 then rinsing the activated metal part to remove nitric
10 acid components,
11 forming a black regulation coating on the rinsed metal
12 part in solution of inorganic salt and organic acid containing
13 trivalent chromium and silica as main ingredients in a conversion
14 treatment step (13) which is arranged next to the rinsing step,
15 rinsing the coated metal part,
16 subsequently forming a black coating on the rinsed coated
17 metal part in an inorganic salt solution containing trivalent
18 chromium and iron components as main ingredients in a black
19 chromate treatment step,
20 rerinsing the black coated metal part,
21 then subjecting the rerinsed metal part to a finish
22 treatment in a finish treatment step by forming a conversion
23 coating on the rerinsed metal part in a solution of inorganic
24 salt and organic acid which contains trivalent chromium and
25 silica as main ingredients and is less concentrated than the
26 solution used in the foregoing conversion treatment step, and
27 drying the finished metal part in a drying step.

1 3. The black hexavalent chromium-free plating treatment
2 system according to claim 1 or 2 wherein the finish treatment
3 step comprises an initial finish treatment step (31) in which
4 a conversion coating is formed in a solution of inorganic salt
5 and organic acid which contains trivalent chromium and silica
6 as main ingredients and a final finish treatment step (33) in
7 which after rinsing following the initial finish treatment, the
8 rinsed metal part is immersed in any one of a overcoat treatment
9 solution containing silica and cobalt as main ingredients and
10 a water-soluble anti-corrosive solution.